MJ. file 1.13 Wahler

PALO ALTO WASHINGTON, D.C. NEWPORT BEACH

W.A. WAHLER & ASSOCIATES P.O. BOX 10023 • 1023 CORPORATION WAY, PALO ALTO, CALIFORNIA 94303 • (415) 968-6250

March 17, 1976
Project 0886

Mr. Gerald Sneddon ✓
General Manager
Beker Industries, Corp.
P.O. Box 37
Conda, Idaho 83230

Subject: Reconstruction of the dike embankment near the southwest corner of Gypsum Pond No. 3 and construction of a new water control decant structure.

Dear Mr. Sneddon:

As we discussed with you on March 10, 1976, following our initial field inspection of the Beker waste disposal facilities, we feel that it would be very difficult to positively identify tbe cause of the recent dike failure near the southwest corner of Gypsum Pond No. 3. We suspect that the high free-water level in the pond was the principal contributing factor and we believe that if a suitable method of controlling and minimizing the free-water level is implemented, the overall stability of the entire dike embankment around Gypsum Pond No. 3 will be substantially improved. In this regard, we basically concur in principle with the decanting method proposed by your staff which essentially consists of constructing a conduit at the foundation level of the dike and providing the capability for periodically raising the upstream decant level as the gypsum tailings and free-water levels increase in the pond. This system should allow an operator to maintain a minimum free-water level, sufficient for the solids to settle out, but will preclude the buildup of unnecessary free-water storage. The proposed method is commonly and successfully used for controlling tailings pond levels by the mining industry throughout the world and, in most cases, has provided a safe and efficient means of operation. Although we have just started work on this project and are not completely familiar with all of the past history and problems at this facility, we have not discovered to date any apparent reasons

why this system cannot be constructed and safely operated by Beker Industries at Soda Springs, provided that good engineering practices are employed in the construction of the facilities. In this regard, we are listing certain aspects of the construction which we consider important and which may require special attention:

Item 1: Due to the low pH of the gypsum tailings water and its tendency to chemically react with the local soils, any seepage from the pond constitutes an undesirable condition because of both environmental effects and possible alteration of engineering properties of the soil embankment and foundation. Therefore, we suggest that any portion of the impervious liner known to have been damaged by the recent dike failure be replaced. It is especially important that a good, lasting seal be accomplished between the impervious lining and the decant conduit.

Item 2: The contact between a conduit and an embankment or a foundation represents one of the more vulnerable areas with regard to the possibility of the occurrence of excessive seepage and piping of the fine-grained soils. We suggest that it may be prudent to assume that a leak could conceivably occur through the impervious liner and, based on this assumption, to design the conduit so that the seepage would be controlled. We, therefore, recommend that seepage cutoff collars be installed at selected intervals around the conduit, and that a stable filter material be placed in conjunction with the collars so as to minimize the possibility of piping along the conduit. It is equally important that special attention be given to the compaction of the material completely surrounding the conduit so that a firm contact is established. Conduit construction must be accomplished on an adequate foundation, carefully prepared to handle the anticipated loading conditions.

Item 3: Finally, for that portion of the dike which is to be reconstructed, we recommend that the dike embankment material be placed and compacted in accordance with acceptable standards such as those provided by the American Society of Testing Materials (ASTM), or by the American Association of State Highway Officials (AASHO). Continuous inspection should be provided to see that these criteria are met.

In summary, we conclude that there is no apparent reason why Pond No. 3 with an adjustable decant facility cannot be repaired and operated in a safe and efficient manner and at a minimal risk of major slope instability.

If you desire our specialized assistance in the final planning and construction of the repairs to Pond No. 3, please do not hesitate to notify us.

Very truly yours,

W. A. WAHLER & ASSOCIATES

Jack G. Wulff

Jack G. Wulff
Chief Engineer

JGW:etc

Enclosure

Copy of letter to:
Mr. Monty Marthus
Environmental Services Division
636 Pershing
Pocatello, Idaho 83201

W.A.WAHLER & ASSOCIATES

Beker Industries Corp.
Box 37, Conda, Idaho 83230
Telephone: 208/547-4381, TWX 910-978-5768

8a

NO. 4 TAILINGS IMPOUNDMENT

Justification

At the end of the 1978 construction season, the embankments on the existing No. 3 Tailings Impoundment will be 50 feet high and will contain slime storage for one year. During the summer of 1979 these embankments could be raised to their ultimate height of 70 feet at a cost of $2,500,000 and would yield only one additional year of storage. At that time a new tailings impoundment would have to be constructed.

By constructing No. 4 Tailings Impoundment during 1979 at a cost of $2,400,000 with three years storage capacity, or 2 more years than building Stage IV on No. 3 Tailings Impoundment at the same cost, excluding the purchase price of the required land which would be required after constructing Stage IV anyway.

Scope of Work

The following work will have to be started during the last quarter of 1978 as indicated.

Start	Complete	Description
9/18/78	10/2/78	Aerial photograph the proposed site.
10/2/78	4/30/79	Acquire land at proposed site.
10/2/78	10/16/78	Perform preliminary land survey for design work.
10/16/78	12/29/78	Geotechnical field and lab tests.
10/16/78	2/26/79	Engineering design work on ditch relocation.

Total monies to be committed during 4th quarter.
(excluding land acquisition) --------$50,000.

BEKER

BEKER INDUSTRIES CORP.
CHARLES F. WHITE PLANT

DATE: 9 / 1 / 78

ESTIMATE SHEET

JOB TITLE: No. 4 Tailings Impoundment - Stage I

AFE NO.: _____ PROJECT NO.: 78-15-131

DRAWING NO. _____ SHEET 1 OF 1

PREPARED BY: J.B. Carpita

APPROVALS

PLANT MGR. _____

ENGINEERING MGR. _____

PRODUCTION MGR. _____

DESCRIPTION	QUANT.	UNIT		USEFUL LIFE 30 yr.	USEFUL LIFE 3 yr.	TOTAL
1. LAND ACQUISITION				$ 650,000		$ 650,000
2. EARTHWORK				330,000	1,020,000	1,350,000
3. MECHANICAL SYSTEMS				1,040,000		1,040,000
TOTAL ESTIMATED COSTS				$2,020,000	$1,020,000	$3,040,000

FH0028670

BEKER INDUSTRIES CORP.
CHARLES F. WHITE PLANT

DATE: 9 / 7 / 78

ESTIMATE SHEET

JOB TITLE: No. 4 Tailings Impoundment - Stage I

APPROVALS

AFE NO.: _____ PROJECT NO.: 78-15-131

PLANT MGR. _____

DRAWING NO. _____ SHEET 1 OF 1

ENGINEERING MGR. _____

PREPARED BY: J.B. Carpita

PRODUCTION MGR. _____

DESCRIPTION	QUANT	UNIT		USEFUL LIFE 30 yr.	USEFUL LIFE 3 yr.	TOTAL
SITE PREPARATION						
1. Land acquisition	350	Acres		$650,000		$650,000
2. Site investigation & soils testing	1	Lot		$ 45,000		$ 45,000
3. Engineering & field layout	1	Lot		$ 35,000		$ 35,000
4. Fencing	2.5	Miles		$ 25,000		$ 25,000
5. Grubbing & Stripping	500,000	Cu.Yd.		$125,000		$125,000
6. Access roads	3.0	Miles		$ 70,000		$ 70,000
7. Relocating farm ditches	1.5	Miles		$ 30,000		$ 30,000
Subtotal				$980,000		$980,000
EMBANKMENT CONSTRUCTION						
1. Earthwork (15 ft. high embankments)	400,000	Cu. Yd.			$865,000	$865,000
2. Slope Protection	40,000	Tons			$ 75,000	$ 75,000
3. Instrumentation	1	Lot			$ 20,000	$ 20,000
4. Engineering & inspection	1	Lot			$ 60,000	$ 60,000
Subtotal				-0-	$1,020,000	$1,020,000
MECHANICAL SYSTEMS						
1. Tailings piping	4,000	L.F.		$375,000		$375,000
2. Reclaim piping	6,000	L.F.		$565,000		$565,000
3. Pump & Barge modifications	1	Lot		$ 25,000		$ 25,000
4. Electrical	1	Lot		$ 75,000		$ 75,000
Subtotal				$1,040,000	-0-	$1,040,000
TOTAL ESTIMATED COSTS				$2,020,000	$1,020,000	$3,040,000

FH0028671

Beker Industries Corp.
Box 37, Conda, Idaho 83230
Telephone: 208/547-4381, TWX 910-978-5768

NO. 4 TAILINGS IMPOUNDMENT

Justification

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By constructing No. 4 Tailings Impoundment during 1979 at a cost of $2,400,000 with three years storage capacity, or 2 more years than building Stage IV on No. 3 Tailings Impoundment at the same cost, excluding the purchase price of the required land which would be required after constructing Stage IV anyway.

Scope of Work

The following work will have to be started during the last quarter of 1978 as indicated.

Start	Complete	Description
9/18/78	10/2/78	Aerial photograph the proposed site.
10/2/78	4/30/79	Acquire land at proposed site.
10/2/78	10/16/78	Perform preliminary land survey for design work.
10/16/78	12/29/78	Geotechnical field and lab tests.
10/16/78	2/26/79	Engineering design work on ditch relocation.

Total monies to be committed during 4th quarter.
(excluding land acquisition) --------$50,000.

BEKER INDUSTRIES CORP.
CHARLES F. WHITE PLANT

DATE: 9 / 7 / 78

ESTIMATE SHEET

JOB TITLE: No. 4 Tailings Impoundment - Stage I

APPROVALS

AFE NO.: _____ PROJECT NO.: 78-15-131

PLANT MGR. _____

DRAWING NO. _____ SHEET 1 OF 1

ENGINEERING MGR. _____

PREPARED BY: J.B. Carpita

PRODUCTION MGR. _____

DESCRIPTION	QUANT	UNIT		USEFUL LIFE 30 yr.	USEFUL LIFE 3 yr.	TOTAL
1. LAND ACQUISITION				$ 650,000		$ 650,000
2. EARTHWORK				330,000	1,020,000	1,350,000
3. MECHANICAL SYSTEMS				1,040,000		1,040,000
TOTAL ESTIMATED COSTS				$2,020,000	$1,020,000	$3,040,000

FH0028673

BEKER INDUSTRIES CORP.
CHARLES F. WHITE PLANT

DATE: 9 / 7 / 78

ESTIMATE SHEET

JOB TITLE: No. 4 Tailings Impoundment - Stage I

APPROVALS

AFE NO.: _____ PROJECT NO.: 78-15-131

PLANT MGR. _____

DRAWING NO. _____ SHEET 1 OF 1

ENGINEERING MGR. _____

PREPARED BY: J.B. Carpita

PRODUCTION MGR. _____

DESCRIPTION	QUANT.	UNIT		USEFUL LIFE 30 yr.	USEFUL LIFE 3 yr.	TOTAL
SITE PREPARATION						
1. Land acquisition	350	Acres		$650,000		$650,000
2. Site investigation & soils testing	1	Lot		$ 45,000		$ 45,000
3. Engineering & field layout	1	Lot		$ 35,000		$ 35,000
4. Fencing	2.5	Miles		$ 25,000		$ 25,000
5. Grubbing & Stripping	500,000	Cu. Yd.		$125,000		$125,000
6. Access roads	3.0	Miles		$ 70,000		$ 70,000
7. Relocating farm ditches	1.5	Miles		$ 30,000		$ 30,000
Subtotal				$980,000		$980,000
EMBANKMENT CONSTRUCTION						
1. Earthwork (15 ft. high embankments)	400,000	Cu. Yd.			$865,000	$865,000
2. Slope Protection	40,000	Tons			$ 75,000	$ 75,000
3. Instrumentation	1	Lot			$ 20,000	$ 20,000
4. Engineering & inspection	1	Lot			$ 60,000	$ 60,000
Subtotal				-0-	$1,020,000	$1,020,000
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1. Tailings piping	4,000	L.F.		$375,000		$375,000
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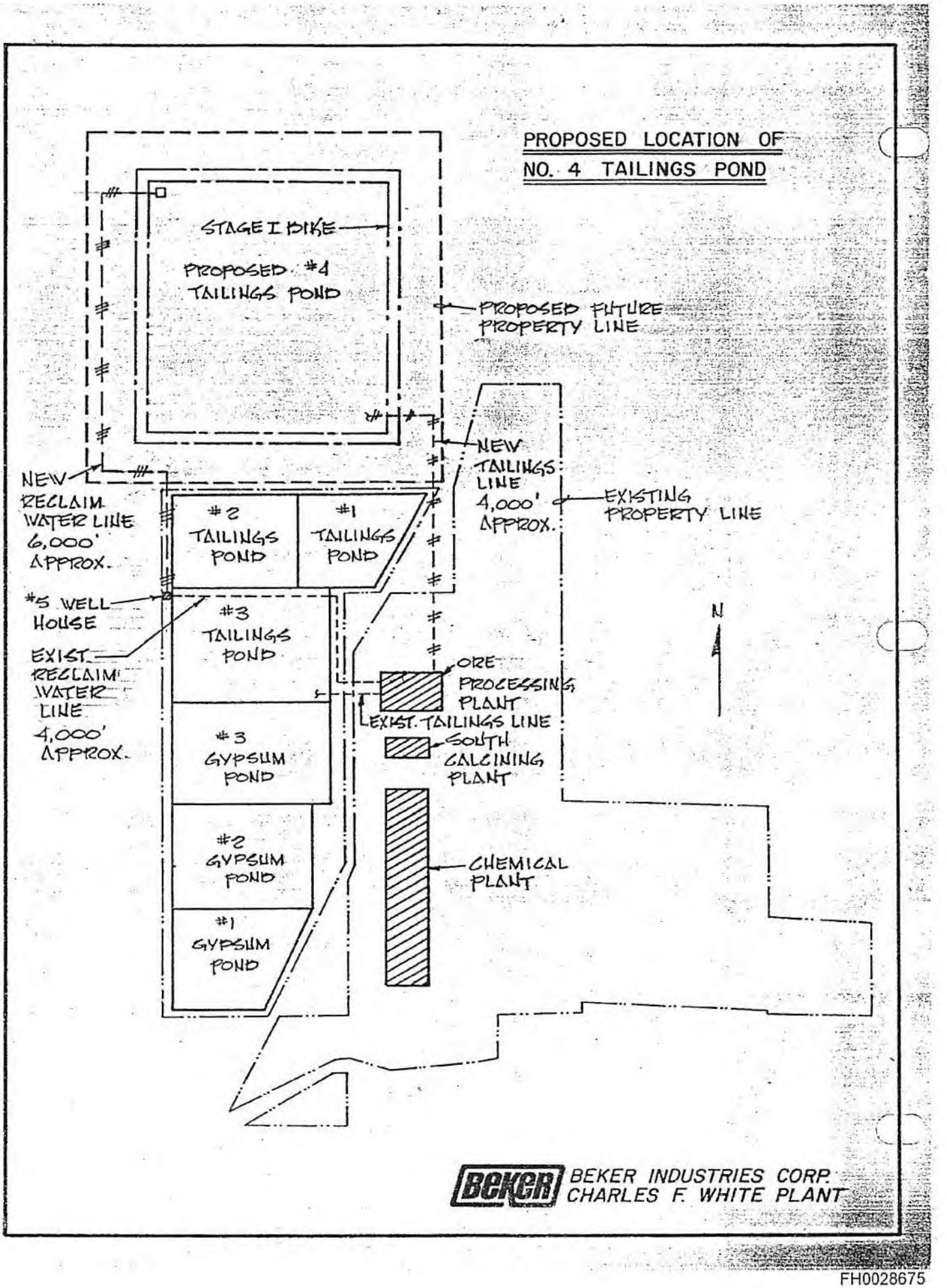
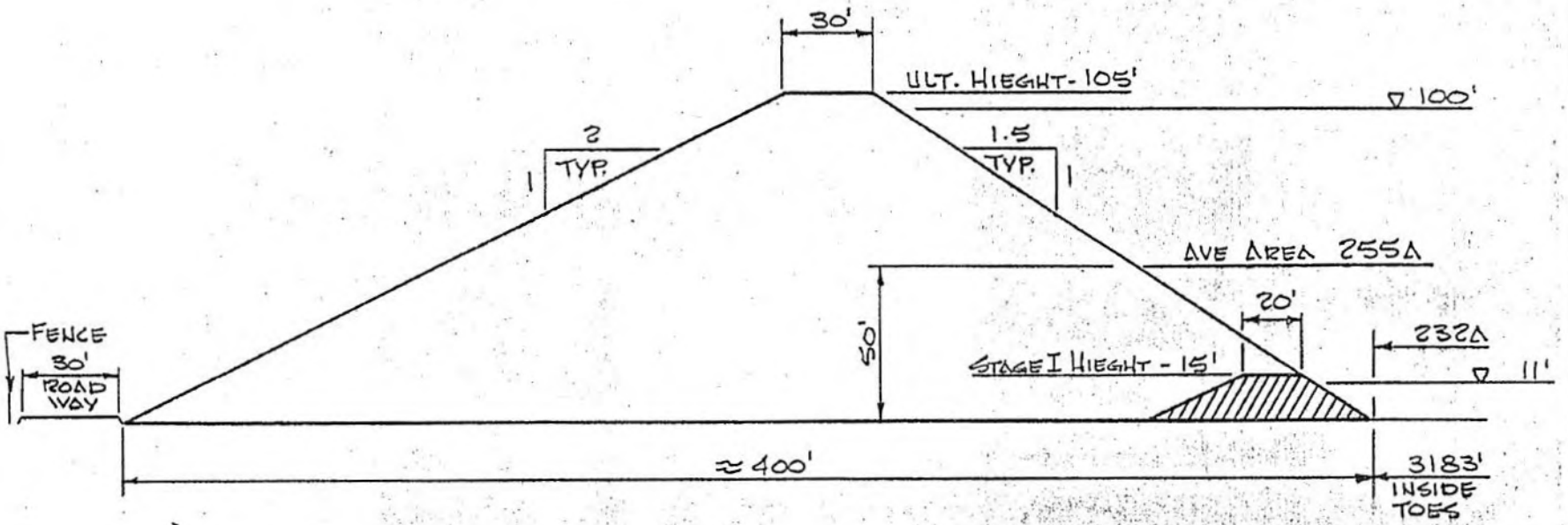
4. Electrical	1	Lot		$ 75,000		$ 75,000
Subtotal				$1,040,000	-0-	$1,040,000
TOTAL ESTIMATED COSTS				$2,020,000	$1,020,000	$3,040,000

FH0028674


PROPOSED LOCATION OF
NO. 4 TAILINGS POND
STAGE I DIKE
PROPOSED #4
TAILINGS POND
PROPOSED FUTURE
PROPERTY LINE
NEW
TAILINGS
LINE
4,000'
APPROX.
EXISTING
PROPERTY LINE
NEW
RECLAIM
WATER LINE
6,000'
APPROX.
#2
TAILINGS
POND
#1
TAILINGS
POND
#5 WELL
HOUSE
EXIST.
RECLAIM
WATER
LINE
4,000'
APPROX.
#3
TAILINGS
POND
#3
GYPSUM
POND
#2
GYPSUM
POND
#1
GYPSUM
POND
N
ORE
PROCESSING
PLANT
EXIST. TAILINGS LINE
SOUTH
CALCINING
PLANT
CHEMICAL
PLANT
BEKER INDUSTRIES CORP.
CHARLES F. WHITE PLANT

FH0028675

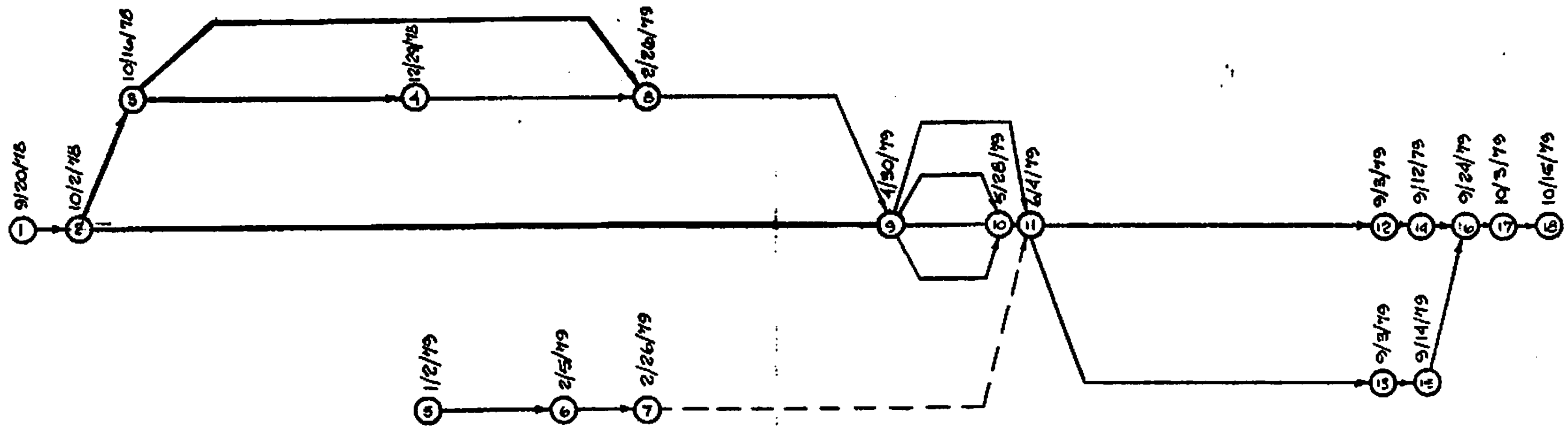


TOTAL LIFE - 30 YEARS OR 67.1 MILLION TONS OF ORE
STAGE I LIFE - 3 YEARS OR 6.8 MILLION TONS OF ORE

NO. 4 TAILINGS IMPOUNDMENT - TYPICAL SECTION

BEKER INDUSTRIES CORP.
CHARLES F. WHITE PLANT

FH00028676



~~1 - 2~~	~~Aerial Photos~~	10/ 2/78
~~2 - 3~~	~~Preliminary Field Survey~~	10/16/78
~~2 - 9~~	~~Land Acquisition~~	4/30/79
~~3 - 4~~	~~Foundation & Soils Testing~~	12/29/78
~~3 - 8~~	~~Ditch Relocation Design~~	2/26/79
4 - 8	Embankment Design	2/26/79
5 - 6	Support Facilities Design	2/ 5/79
6 - 7	Purchase Materials	2/26/79
7 - 11	Materials Delivery	6/ 4/79
8 - 9	Permit Approval	4/30/79
9 - 10	Fencing, Clearing, & Road Constr.	5/28/79
9 - 11	Relocate Ditches	6/ 4/79
10 - 11	Field Layout	6/ 4/79
11 - 12	Embankment Construction	9/ 3/79
11 - 13	Support Facilities Construction	9/ 3/79
12 - 14	Slope Protection	9/12/79
13 - 15	Modify Barge	9/14/79
14 - 16	Instrumentation	9/24/79
15 - 16	Install Barge	9/24/79
16 - 17	Place Impoundment in Service	10/ 3/79
17 - 18	Clean-Up	10/15/79

REFERENCE DRAWINGS		REVISIONS				
DRAWING NO.	TITLE	NO.	DATE	BY	DESCRIPTION	APR

ENG. RECORD		DATE
DRAWN BY	H.S.	9/25/78
CHECKED BY		
APPR. BY	K.P.	9/26/78
P.O. NO. Proj # 78-15-131	JOB NO.	

BEKER INDUSTRIES CORPORATION
CHARLES F WHITE PLANT CONDA, IDAHO

ARROW DIAGRAM (PRELIMINARY)
No 4 TAILINGS IMPOUNDMENT

SCALE: | DWG. NO. | REV.

FORM P-1-1559 2-78

FH0028677

Beker Industries Corp.
Box 37, Conda, Idaho 83230
Telephone: 208/547-4381, TWX 910-978-5768

NO. 4 TAILINGS IMPOUNDMENT

Justification

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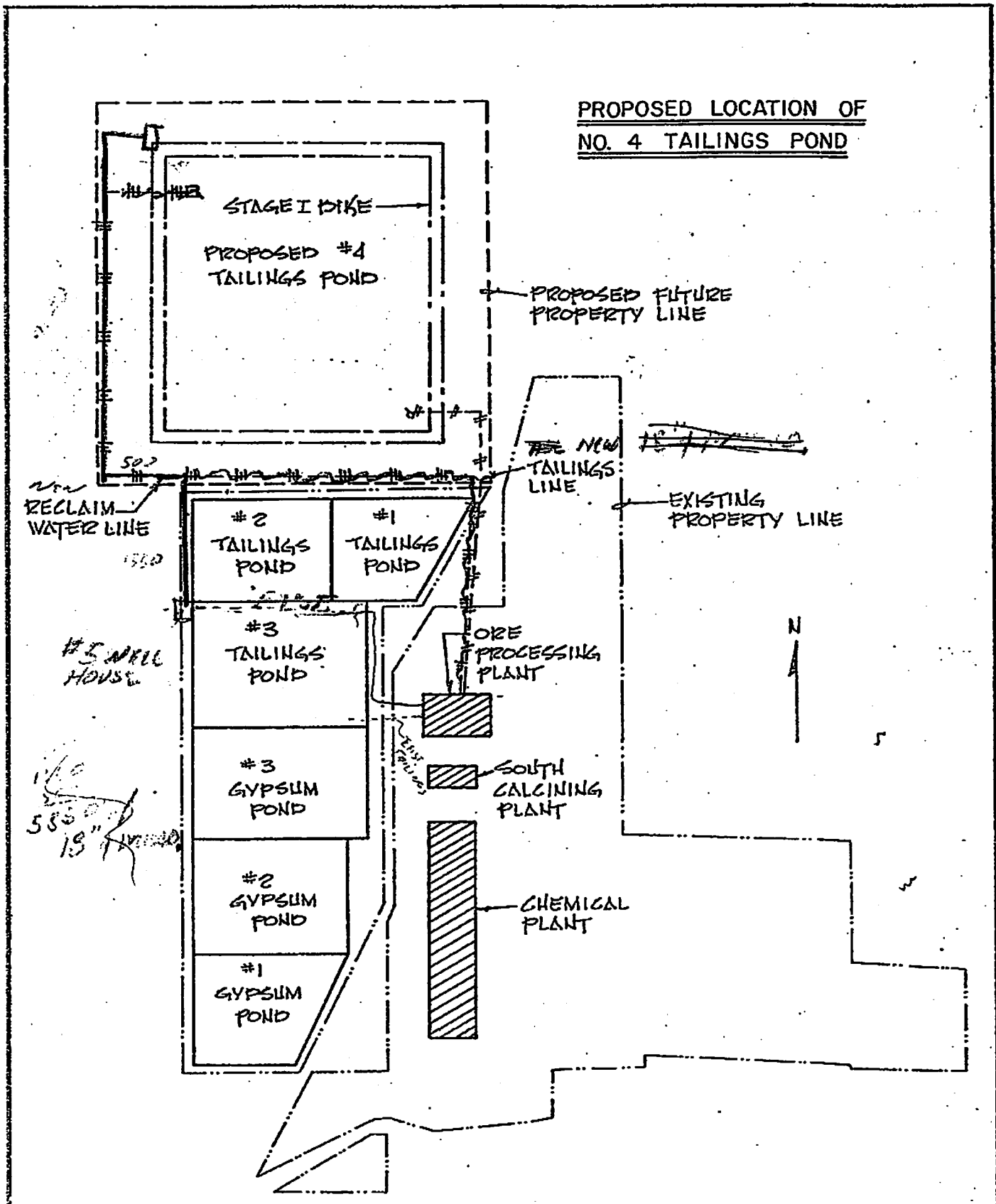
Scope of Work

The following work would have to be completed as indicated to take advantage of the cost savings of constructing No. 4 Tailings Impoundment during 1979.

Required Completion Date		
1-1-79	1.	Acquire approximately 350 acres of land north of existing impoundments.
4-1-79	2.	Perform soil investigation, engineering design, and field layout of impoundment, and support facilities.
7-1-79	3.	Clear the land, reroute existing farm ditches, fence property, and construct access roads.
10-1-79	4.	Construct 15 feet high starter embankments, approximately 400,000 cubic yards, including slope protection and instrumentation to meet Dam Safety regulations.
10-1-79	5.	Install new tailings line from Wash Plant to southeast corner of No. 4 Tailings Impoundments.
10-1-79	6.	Install new reclaim water line from northwest corner of No. 4 Tailings Impoundment to existing reclaim water line at No. 5 Well House and use existing reclaim water pump to boost water to ore processing area.
10-1-79	7.	Modify existing reclaim barge and install new vertical reclaim water pump on the barge to reclaim water from No. 4 Tailings Impoundment, including new 13,800/480 V electrical power line.

JC/jb


PROPOSED LOCATION OF
NO. 4 TAILINGS POND
STAGE I DIKE
PROPOSED #4
TAILINGS POND
PROPOSED FUTURE
PROPERTY LINE
NEW
TAILINGS
LINE
EXISTING
PROPERTY LINE
RECLAIM
WATER LINE
#2
TAILINGS
POND
#1
TAILINGS
POND
#3
TAILINGS
POND
ORE
PROCESSING
PLANT
N
#3
GYPSUM
POND
SOUTH
CALCINING
PLANT
#2
GYPSUM
POND
CHEMICAL
PLANT
#1
GYPSUM
POND
BEKER INDUSTRIES CORP.
CHARLES F. WHITE PLANT

FH0028679

FH0028680

1-98

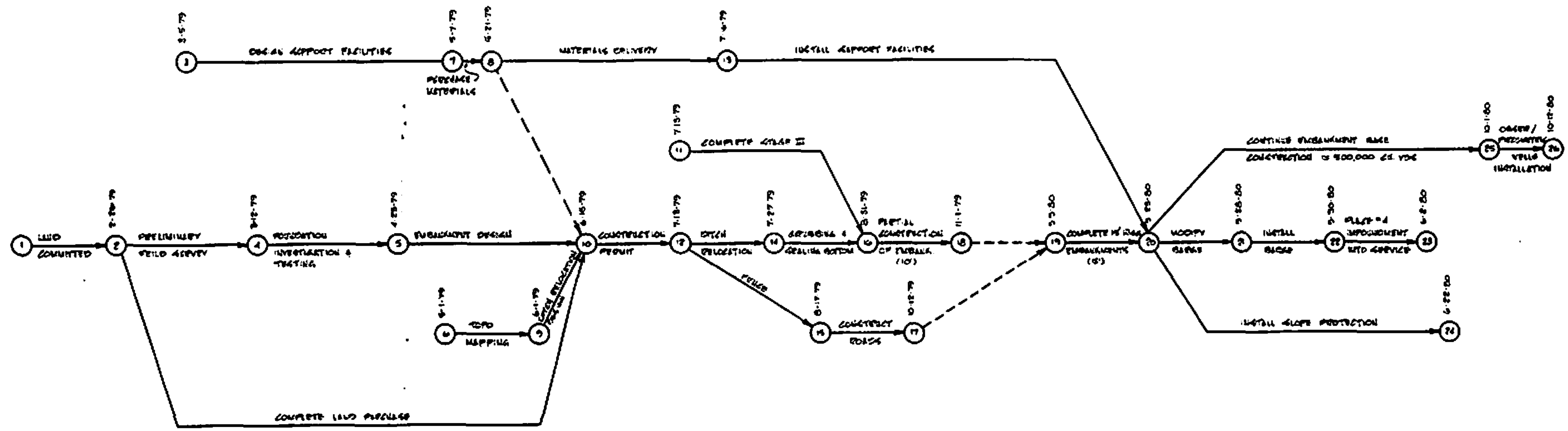
FH0028682

8b-2

FH0028684

8b-3

FH0028686



C. F. WHITE PLANT
BEKER INDUSTRIES CORP.
ARROW DIAGRAM (PRELIMINARY) (1979-80)
#4 TAILINGS IMPOUNDMENT STAGE I
DWG NO.

FH0028687